REMARKS

In the Office Action of September 16, 2004, the Examiner states that the above-referenced application contains claims directed to ten patentably distinct inventions (referred to as Species A – J, and associated figures). Applicant respectfully disagrees.

Three embodiments of a diffraction grating are disclosed. Diffraction grating 100 is embodied in Figure 1 (diffraction grating 100, shown in active state, p. 3, lines 28 - 29), Figure 2 (diffraction grating 100, shown in non-active state, p. 4, lines 1 - 2), and Figures 3A, 3B, and 3C (three top views of diffraction grating 100). Diffraction grating 100 is characterized by a movable component 10, comprising a plurality of cross beams 14 coupled to two long beams 12, and a stationary component 20, comprising a plurality of projecting beams 22, wherein the cross beams are alternately disposed between the projecting beams (Figures 1, 2, 3A – 3C), wherein a plurality of square wells 30 are formed when the movable component is actuated (claim 1) or not actuated (claim 11).

Diffraction grating 200 is embodied in Figure 4 (diffraction grating 200, shown in non-active state, p. 4, lines 5 - 6), Figure 5 (diffraction grating 200, shown in active state, p. 4, lines 7 - 8) , Figures 6A and 6B (side views of diffraction grating 200), and Figure 7 (multiple diffraction gratings 200 disposed side-by-side, p. 4, lines 11 - 12). Diffraction grating 200 is characterized by a movable component 110, comprising a plurality of projecting beams 130 coupled to one or more long beams 150, and a stationary component comprising a plurality of stationary beams 120, wherein a plurality of square wells 140 are formed when the movable component is actuated (claim 13) or not actuated (claim 21).

Diffraction grating 300 (Figures 8, and 9A – 9E) is characterized by a plurality of blocks 310 arranged in a row (a row being a horizontal queue of blocks, p. 10, line 30), the row being disposed atop a substrate 330, wherein each of the plurality of blocks can be independently moved toward or away from

the substrate, such that a plurality of square wells 320 are formed when selected blocks are moved (claim 28). Because the blocks 310 are square in shape, light can possibly be diffracted in two directions with the diffraction grating 300 (page 11, lines 9 – 11).

The simplified drawing of Figure 8 illustrates the diffraction grating 300 as a collection of identically shaped blocks 310. However, it is disclosed that the diffraction grating may be formed using overlapping, parallel beams. Above the substrate 330, a first long beam (FLB) may be positioned above and intersecting with a second long beam (SLB). The first long beam would have blocks extending upward from it (like the projecting beams extending upward from the stationary component 20 in Figure 1, in which the projecting beams are square blocks 310). The second long beam, intersecting with the first long beam, would have holes slightly larger that the size of the square blocks 310, through which the blocks extending upward from the first beam can be disposed during actuation, forming the square wells 320 (page 11, lines 26 – 30 – page 12, lines 1 – 2).

Figures 9A – 9C are simplified diagrams showing the possible arrangements of blocks in order to achieve diffraction in one direction or another in the diffraction grating 300. Some of the blocks 310 are shaded, to indicate blocks which are recessed adjacent to unrecessed blocks (unshaded), to form square wells 320. The checkerboard pattered diffraction grating 300 of Figure 9A diffracts light in the horizontal direction or the vertical direction (page 12, lines 19 – 25). In Figure 9B, alternate rows of blocks are recessed, for diffraction perpendicular to the rows (page 12, line 26 – page 13, line 2). In Figure 9C, alternate columns of blocks are recessed, for diffraction parallel to the rows (page 13, lines 3 – 7). In Figure 9D, a single block of a 4-block set is recessed, allowing diffraction in both the horizontal and the vertical directions (page 13, lines 8 – 12). In Figure 9E, three blocks of a 4-block set are recessed, which also allows diffraction to occur in both horizontal and vertical directions.

Because the blocks 310 of the diffraction grating may be connected using long beams disposed underneath, as described above (see also page 11, lines 26 – 30 – page 12, lines 1 – 2), diffraction in the horizontal direction, diffraction in the vertical direction, diffraction parallel to the row, diffraction perpendicular to the row may alternately be described as parallel-to-beam diffraction.

Claims 23 – 27 bring diffraction grating 100, diffraction grating 200, and diffraction grating 300 together. Claim 23 recites "a means for moving a plurality of movable beams (10, 110, or FLB) between a plurality of stationary beams (20, 120, or SLB), wherein the plurality of movable beams (10, 110, or FLB) are coupled to one or more long beams (12, 150, or 310),...wherein a plurality of square wells (30, 130, or 320) are formed when the plurality of movable beams (10, 110, or FLB) are actuated [note: this could have said "unactuated"], ***wherein diffraction parallel to the one or more long beams*** (12, 150, or FLB) ***occurs*** when light strikes the square wells." Claims 1 and 11 (diffraction grating 100), claims 13 and 21 (diffraction grating 200) also disclose the "diffraction parallel to long beam" limitation. Claim 30 recites that the diffraction grating 300 occurs in a direction parallel to the row (since "long beams" are not recited in independent claim 28). (The diffraction grating 300 can actually diffract light in two directions simultaneously, see page 11, lines 9 – 11.)

All three of the diffraction gratings 100, 200, 300 thus share the inventive feature of parallel-to-beam diffraction (see specification, p. 4, lines 27 – 28; p. 5, lines 4 – 5, p. 10, lines 1 – 2, 13 – 14, and 23 – 26, and page 12, lines 3 - 8). Like claims 23 – 27, claims 46 and 47 explicitly refer to both diffraction gratings 100 and 200, claim 46 including the recitation, "wherein diffraction parallel to the at least one long beam occurs," and implicitly refer to the diffraction grating 300. Claims 52 – 53 recite a monochromator which may use any one of the diffraction grating 100, the diffraction grating 200, or the diffraction grating 300.

Thus, claims 1 – 10, 11 – 12, 13 – 20, 21 – 22, 23 – 27, 46 – 47, and 52 – 53 all refer to a diffraction grating in which parallel-to-beam diffraction occurs.

Claims 28 – 45 refer to a diffraction grating in which parallel-to-beam diffraction may occur, perpendicular-to-beam diffraction may occur, and simultaneously, diffraction in both directions, may occur (depending on the actuation of blocks, as described in Figures 9A – 9E). "Diffraction parallel to one or more long beams" is thus also a feature of the diffraction grating 300. Thus, all claims (and associated Figures) should be considered part of a single species. Thus, restriction is improper and Applicant respectfully requests prosecution on all claims as a single invention.

If the Examiner prefers, Figure 8 can be redrawn to show first long beams and second long beams, as the disclosure refers to long beams connecting the blocks 310 (page 11, lines 26 – 30 – page 12, lines 1 – 2). Since there are a number of ways to do the connections (as illustrated in Figures 9A – 9E), these illustrations were kept simple. However, Applicant is happy to rework these drawings to clarify that diffraction grating 300 is embodied in independent claim 23.

Thus, at least claim 23 reads on the diffraction gratings 100, 200, and 300. Since claim 23 is generic (MPEP 806.04(d)) to all three diffraction gratings 100, 200, 300, restriction is improper. Since independent inventions, as defined under MPEP 806.04, are not found here, Applicant respectfully requests prosecution on the merits of all claims recited and all embodiments disclosed.

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Respectfully Submitted,

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Date

Carrie A. Boone
Reg. No. 48,282
CARRIE A. BOONE, P.C.
2450 Louisiana, Suite 400-310
Houston, Texas 77006
713-521-2176 Main
713-521-2177 Fax